

What is claimed is:

1. A bumper beam energy absorber for use with an automotive vehicle comprising at least one layer of cell panels having interconnected closed loop cells defining an open cell network, said open cell network comprising at least two different sized cells positioned in at least two sections to absorb more energy in one section than another.
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2. A bumper beam energy absorber as set forth in claim 1, wherein said energy absorber includes at least two layers of said cell panels.
- 10 3. A bumper beam energy absorber as set forth in claim 2 wherein each of said open cell networks of each of said layers has at least two different sized cells positioned in at least two sections to absorb relatively more energy in one section than another.
- 15 4. A bumper beam energy absorber as set forth in claim 3 wherein said positioning of said sections of said layers of cell panels cooperate to absorb energy.
5. A bumper beam energy absorber as set forth in claim 4 wherein a reinforcing sheet material is interposed between said layers of cell panels.
6. A bumper beam energy absorber as set forth in claim 4 wherein said layers of cell panels are enclosed with a reinforcing sheet material.
- 20 7. A bumper beam energy absorber as set forth in claim 1 wherein each of said cell panels are extruded.
8. A bumper beam energy absorber as set forth in claim 7 wherein said extruded cell panels has said at least two sections wherein a first of said two sections has cells of a first predetermined size and wall thickness and a second of said two sections has cells of a second predetermined size and wall thickness, less than said first predetermined size and wall thickness.
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9. A vehicle bumper system comprising
an impact beam configured to be attached to a vehicle frame,
a fascia positioned to conceal said impact beam, and
30 an energy absorber sandwiched between said impact beam and said fascia, said energy absorber comprising at least one layer of cell panels having interconnected closed loop cells defining an open cell network, said open cell network

comprising at least two different sized cells positioned in at least two sections to absorb more energy in one section than another.

10. A vehicle bumper system as set forth in claim 7 wherein said energy absorber is contoured to nest within and support said fascia.

5 11. A vehicle bumper system as set forth in claim 10 wherein each of said cell panels are extruded.

12. A vehicle bumper system as set forth in claim 11 wherein said extruded cell panels has said at least two sections wherein a first of said two sections has cells of a first predetermined size and wall thickness and a second of said two sections has cells 10 of a second predetermined size and wall thickness, less than said first predetermined size and wall thickness.

13. A vehicle bumper system as set forth in claim 12, wherein said energy absorber includes at least two layers of said cell panels.

14. A vehicle bumper system as set forth in claim 13 wherein each of said open cell networks of each of said layers has at least two different sized cells positioned in the at least two sections to absorb relatively more energy in one section than another.

15. A vehicle bumper system as set forth in claim 14 wherein a reinforcing sheet material is interposed between said layers of cell panels.

20 16. A vehicle bumper system as set forth in claim 14 wherein said layers of cell panels are enclosed with a reinforcing sheet material.

17. A vehicle bumper system as set forth in claim 14 wherein an outermost layer of cell panels is configured to collapse more readily than an inner layer of cell panels.

18. A vehicle bumper system as set forth in claim 17 wherein said outermost layer is adjacent said fascia.

25 19. A method of manufacturing a vehicle bumper system, said method comprising the steps of:

extruding a sheet material into a cell panel having an open cell network comprising at least two different sized cells positioned in at least two sections to absorb more energy in one section than another;

30 combining at least two cell panels to form an energy absorber;
conforming an outer face of said energy absorber to complementarily fit within an inner face of a fascia;

combining said energy absorber between said fascia and an impact beam.